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ABSTRACT

The concept that society must possess an ecological conscience which can relate to economic, social, political, and other disciplines of culture to meet the challenge of maintaining a quality environment, represents the basis philosophical rationale for these instructional materials. They are designed to give specific emphasis to the ecological implications of man's activities as generally explored in the social studies curricula for grades four through six. The outdoor laboratory approach is employed to encourage students to become more aware of their responsibilities as citizens in conserving and preserving man's natural resources. Five generalizations about man's relationship to his environment serve as a base around which concepts, questions, and activities are built. Three concepts are identified for each generalization, and individual concepts detail open-ended questions, discovery activities, appropriate terms or vocabulary words, and instructional materials (multimedia). Performance objectives, suggestions for evaluation, and a bibliography of books and field guides are also provided in this curriculum guide. (BL)

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NOLDE FOREST STATE PARK
ENVIRONMENTAL EDUCATION CENTER

ENVIRONMENTAL EDUCATION CURRICULUM GUIDE
for
INTERMEDIATE SOCIAL STUDIES

GRADE LEVEL 4th
5th
6th

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FOREWORD

As we begin this decade of the seventies, man has become increasingly aware of the fact that to preserve the earth's natural environmental quality is, in essence, to insure his own survival as a species. Daily this fact is made blatantly clear as we read of air, water and land pollution as well as the possible consequences of the population explosion. To be sure, man has learned that the life necessities provided him by the earth can no longer be looked upon as being inexhaustible. His intellect has led him to develop a cultural blanket environment which is increasingly smothering the natural resources of the planet. Furthermore, as humbling as it may be, man must also learn that, biologically speaking he is no different than the rest of the organisms on the face of the earth.

The challenge of maintaining a quality environment is certainly a formidable one but, by no means one which cannot be conquered. The ultimate determiner of success, however, is whether we will meet this challenge intellectually and immediately, and not let it pass us by. To permit it to do so could be disastrous.

Any attempt to meet the challenge of maintaining a quality environment must be centered in a society that is not only well educated ecologically but also, that possesses an ecological conscience, which can be related to economic, social, political and other disciplines of culture. This concept is the basic philosophical rationale behind the instructional materials contained within this book.

These materials represent the combined efforts of many creative educators whose awareness of the need to conserve our natural resources has led them to a commitment in environmental education.

The fundamental premises underlying the writing and use of these materials are an interdisciplinary one. The first of these is that an understanding of the inherent values of our natural resources must become a part of existing social studies curricula. Such understandings must involve a primary through senior high curriculum approach in order to develop a population capable of serving the environment. The second, its value is through an 'open-ended' or 'discovery' approach. Those using these materials will find no answers given. The teacher will, in many instances, be 'discovering' along with the students. This is only possible if the teacher is willing to admit that he or she does not have all the answers and that through a variety of procedures solutions to problems may be obtained. Teachers exploring this method will share with their students a new enthusiasm and curiosity for learning. The third premise is that teachers must learn to use these materials. One must be nurtured in both the 'open-ended' approach and the ecological complexities existing in the classroom, as well as in 'outdoor classroom' situation.

Generalizations have been 'specially' developed, i.e., they are reinforced by concepts of increasing complexity at each higher grade level. The central theme of this development is 'man's relationship to his environment'. Concepts and generalizations are not to be presented as such. Rather students should be lead toward an understanding through use of suggested questions and activities carefully selected by the teacher. The teachers are expected to adopt these materials in toto, and are to be used as core curriculum guides.

They are to supplement and enrich present social studies curricula by adding a dimension in environmental education.

Outdoor activities are asterisked and teachers are encouraged to use their own school grounds as well as other natural areas that may be available in the use of these activities. Teachers are also encouraged to suggest new outdoor activities and/or make improvements in existing activities.

Specific instructional materials are suggested throughout this book. However, to make a specific lesson even more meaningful teachers are encouraged to make their own over-head transparencies or to use those that may be commercially available. Some of the commercial sources which the Environmental Education Center feel should be considered are:

Keuffel and Esser Co. (Transparency Masters)
Hoboken, New Jersey

Ward's Natural Science Est., Inc. (Transparency)
P.O. Box 1712
Rochester, New York 14603

Osaid (Transparency Masters)
Osaid Division
General Anilene and Film
Johnson City, New York

Instructo Corp. (Transparency)
Paoli, Penna.

The Nolde Forest State Park Environmental Education Center sincerely hopes that these materials will not only prove to be a significant contribution to a school's social studies curriculum, but also will help to develop a citizenry that is concerned about its environment.

PERFORMANCE OBJECTIVES

1. To help students increase through social studies their awareness and appreciation of the value of natural resources and the need for preserving and improving the quality of the environment.
2. To provide opportunities for pupils to develop and improve their social skills and techniques in using their environment properly.
3. To help the student to accept responsibility to maintain or make wise use of his environment in order that other people now and in the future can get maximum benefits from the environment.
4. To increase student appreciation and understanding of the interdependence and interrelationship of the natural and cultural environments.
5. To provide student with the basic environmental knowledge which will allow him to present possible solutions for environment problems.

SOCIAL STUDIES OVERVIEW

These materials have been tailored to the use of the outdoors as a laboratory. They are designed to give specific emphasis to the ecological implications of man's activities as generally explored in current Social Studies curricula.

Because social studies teaches the interactions of man with his environment and has, as a major goal, the training of good citizens, the use of the outdoors will afford personal and realistic learning experiences for student and teacher alike. It provides a stimulating setting in which students may explore new found interests as they relate to their environment and become more aware of their responsibilities as citizens to conserve and preserve man's natural resources.

The five generalizations around which concepts, suggested questions and activities have been developed alert the student to his role as a responsible citizen. Because of time limitations, only the Intermediate concepts have been developed. However, even these materials are not to be considered a complete course of study. They should be used to supplement Units currently being taught. Sources of audio-visual and other instructional material are listed at the back of each unit.

Teachers are encouraged to use these materials with an "open-ended" approach. That is, stimulate student curiosity and interest with questions and activities and allow a free pursuit of ideas and conclusions without concern for predetermined answers.

The questions and activities are only suggested; the teacher may change, omit or add to fulfill individual and group needs. We would appreciate constructive criticism by teachers using this materials and suggestions on how we can improve it.

FLOW CHART

Generalizations I

Man's natural environment has influenced his total development.

Man's basic struggle in life has been to exploit his natural environment.

Man, as the most intelligent organism, has an obligation to his society to foster in it's citizenry the attitudes, interest, and appreciation that will develop civic and moral responsibility for their environment.

Advances in Science and technology have helped raise man's living standard and have increased his leisure time.

Population explosion has made it imperative for man to reconsider his use of his natural resources in a constructive and conservative manner.

Intermediate

- A. His environment has given modern man the natural products for personal use and industrial development.
- B. All through history man has tended to settle near water and productive land.
- C. Man uses many natural products for industrial development.

- A. Man has developed methods to preserve, and has prescribed laws to protect, wildlife and forests.
- B. Good farming practices improve man's food supply.
- C. Man has harnessed water for power.

- A. An interest and appreciation of their natural environment should be reflected in favorable attitudes of American youth toward their country's beauty and bounty.
- B. Good citizens must feel a personal respect for their environment.
- C. A responsible citizen must be kept enlightened in order to fulfill his obligations.

- A. Man has consistently used his natural environment to meet his needs and demands.
- B. Machines have made man's life easier and the demands on his earth more intense.
- C. With technological advancement and increased human demands, man is rapidly consuming his natural resources.

- A. Population explosion sets off an economic chain reaction which, in turn, emphasizes the need for sound ecological practices.
- B. Man may upset nature's balance by unwise and careless practices.
- C. Recent population trends make it imperative for us to reconsider the use of our resources.

INTERMEDIATE SOCIAL STUDIES

I. MAN'S NATURAL ENVIRONMENT HAS INFLUENCED HIS TOTAL DEVELOPMENT.

- A. His environment has given modern man the natural products for personal use and industrial development.

QUESTIONS:

1. What are the essential requirements for man's survival?
 - a. What part do oxygen, water, soil, and the sun's energy play in man's existence?
 - b. How does the natural phenomenon, photosynthesis, aid in man's survival?
2. In what ways has man used nature for his personal development?
 - a. How have local, state and national parks aided man?
 - b. How can man preserve the wonders of nature for their scenic beauty?
 - c. For what activities of man do the flora and fauna of nature provide a natural setting?
 - d. In what ways do the support and protection, which the forest provides for all organisms, affect man?
3. In what ways has nature been the stimulus for man's industrial development?
 - a. What needs of man has the forest provided?
 - b. What rapidly developing industries has man developed from nature to suit his recreational purposes?
 - c. How has man's synthetic products helped to preserve his natural resources.

ACTIVITIES

1. In a series of experiments, a terrarium might have its oxygen, water, and temperature varied. Children can observe and record in a diary or chart the apparent effects on the plant life in the terrarium as the essential requirements are changed. Then, with this background of understanding, the students can be brought to a living model of a terrarium such as the arboretum or state park and observe and record the ways in which natural elements contribute to man's survival. In a series of visits to a natural area students might observe changes and record them as a progress report.

- 2a. Construct a giant map of the local parks and recreation areas. By using a key, students can indicate recreation available at present, or they may block out the parks, designating their own plan for their wise use. Along the same line students may construct state maps, labeling state and national parks.
- *b. Students may make a trip to the selected wooded area to note the ways it has been and can be preserved as an area of beauty and protection for organisms within it. This would be emphasized to the children as a "don't collect" or "don't unbalance nature" venture.
- c. Discuss the fishing, hunting, and camping activities of man which utilize the flora and fauna. Visit an out of door area where man has not been permitted to use his environment for recreation. The students can demonstrate their understanding of the difference between an area in its natural state and one that man has used, through a series of individual or small group dioramas. A third diorama might reflect what man is doing to preserve natural areas from devastation.
- *d. A group of students may study a small section (wooded area or pond) noting the balance of nature maintained there and relating this to ways they can help maintain this balance in other places.
- 3a. Construct regional maps showing what forests supply for man's use. (For example: maple sugar in Vermont and New York).
- b. Students may construct a mock-up of a town, noting the variety of uses of wood in the structures and industries. A park in the town might show man using trees as natural assets.
- c. Construct a timeline, the scope of which might include the United States from exploration to the present. It would depict man at different periods using his environment for his needs and recreation.
- d. Using the theme, "Woodman, Spare that Tree", direct children to explore the parts of the tree that man has used commercially, and then to research the synthetic products that he has developed which prevent the wholesale destruction of our woodland resources.

- g. Show the following films and filmstrip to show the natural products used by man.

Films.

"Our Part in Conservation", McGraw-Hill.

"Science Conserves the Forest", Ed-Horizons.

"The Meaning of Conservation", Cor., D.C.P.I.M.C.

Filmstrip: "Our National Parks", Eyegate.

TERMS TO UNDERSTAND

existence	inventiveness	recreation
fauna	natural environment	scenic
flora	organisms	synthetic
industrial	phenomenon	total development
influence	photosynthesis	culture
predator	man-made environment	

- B. All through history man has tended to settle near water and productive land.

QUESTIONS:

1. How has proximity to water influenced man's total development.
 - a. How has water affected man's transportation and his resources through history?
 - b. What basic requirements did living near water fulfill?
 - c. What forms of recreation have developed from man's proximity to water?
 - d. How has man used lakes, oceans, streams, and river for industrial development?
2. What relation has fertile land had to man's total development?
 - a. What early civilizations developed along fertile river beds?
 - b. What part has fertile land played in developing agrarian societies?
 - c. How have Americans fed and clothed themselves through their use of soil?
 - d. How did fertile land contribute to the development of superior cultures?
 - e. Has your local community settled near a water source?

ACTIVITIES

1. Study the commercial and industrial activities that developed along the Delaware or Mississippi rivers. By examining the cargo that both rivers transport, the students will gain insights into the nature of the commerce and industry that depends on these waterways. Have them portray the individuals who are part of the river story, such as Delaware River boat pilots, ocean captains or crew members on

board cargo ships. Different kinds of boats would suggest the people necessary for their operation and the interactions of men and nature.

- *2. Map local regional waterways and label commercial and industrial activities that have developed along them.
- *3. Discuss the importance of water to the development of such cultures as the American Indian, Egyptians, Greeks, Romans, Phoenicians, and the Carthaginians. Take a field trip to a local museum to investigate these civilizations.
4. Show the Film: "Plants Make Food", Syr., Ind., S.S.A.V.L. to enlarge on #2.
5. The following film might introduce this unit: "How Water Helps Us", Cor., Ind., Syr.
6. A film which might conclude this unit or be used in the culminating stages: "Clean Waters", G.E., S.S.A.V.L., Syr.

TERMS TO UNDERSTAND

agrarian	productive
civilization	proximity
culture	society
environment	"Superior Culture"
fertile	fall line

C. Man uses many natural products for industrial development.

QUESTIONS:

1. What minerals has man tapped for his economic use?
 - a. What uses has man made of the following non-metallic mineral fuels: coal, natural gas, petroleum?
 - b. How have such raw materials as salt, sulphur, and lime contributed to man's industrial development?
 - c. How have non-metallic fertilizer minerals, including nitrates, potash, and phosphates affected man's industrial growth?
 - d. What needs of man have these non-ferrous metals satisfied: copper, lead, zinc, aluminum, tin, magnesium, and mercury?
 - e. How have the following non-ferrous precious metals influenced man's economy: gold, silver and platinum?
2. What role has lumber played in man's industrial development?
 - a. What specific kinds of lumber serve various needs and demands of man?
 - b. How does the forest contribute to man's paper supply?
3. What part has water played in the industrial development of man?
 - a. How has man controlled water resources for his own purposes?
 - b. What industries began primarily because they were near a source of water?
4. How has soil helped man in his industrial development?
5. What part has wildlife played in the industrial development of man?

ACTIVITIES

1. Students may be encouraged to research the ways minerals are being used in industries in a specific area (such as their own town).

They may visit industries or invite representatives of industries to school, interviewing them to discover what uses they have for various non-metallic and metallic minerals.

After the students have studied industrial use of mineral supply, they may reflect their information in a variety of ways. Some may chart, graph, or map man's uses of coal, copper, gold, etc. others may depict, in mock-ups or models of town, the industries that exist, labeling minerals they are using.

- 2a. Examine cross sections of trees to study growth rings. Include a variety of kinds of trees; note the specific ways that a variety of kinds of lumber meets man's needs and demands.

Students, after a visit to a wooded area to identify the kind of life there, may depict the forest in a huge frieze; on another companion frieze the students may develop an urban scene, using the same trees in their final forms in buildings and other materials. These friezes would demonstrate how wood has helped man to create his residential and commercial environments.

- b. Trace the development of paper from raw material (tree) through the processes that make paper. This may be done in a number of ways. Students may visit a paper manufacturing plant if that is expedient. If a visit is not possible, there are charts and diagrams picturing the panorama of papermaking (sample: "Panorama of Papermaking Today", put out by the West Virginia Pulp and Paper Company).
- c. The following transparencies will help build background as activity progresses:

"The Tree"
"Forest Products"
"Where Forests Grow"
"From Pulp Wood"
"Miscellaneous Products"
"Plywood Mills"

TERMS TO UNDERSTAND

ferrous
fertilizer
metallic
non-ferrous

non-metallic
precious metals
tapped

INSTRUCTIONAL MATERIALS

Film (16 mm)

"Clean Water". G.E., Syr., Ind., S.S.A.V.L.
"How Water Helps Us", Cor., Syr., Ind.
"Meaning of Conservation", Cor., Syr., Ind.,
D.C.R.I.M.C.
"Our Part in Conservation", McGraw-Hill, Ind.,
S.S.A.V.L.
"Plants Make Food", Churchill, Syr., Ind.,
S.C.A.V.L.
"Science Conserves the Forest", Educational
Horizons, S.S.A.V.L.

Filmstrips:

"Our National Parks", Eyegate

Transparencies:

"Forest Enemies"
"Forest Products"
"Plywood Mills"
"Pulpwood"
"The Tree
Where Forests Grow"
"Wood Hydrolysis"

II. MAN'S BASIC STRUGGLE IN LIFE HAS BEEN TO EXPLOIT HIS NATURAL ENVIRONMENT.

- A. Man has developed methods to preserve, and has prescribed laws to protect, wildlife and forests.

QUESTIONS

1. What are some of man's methods to preserve wildlife?
 - a. In what ways has man encouraged conservation of wildlife in forests, parks, and ponds?
 - b. Why is educating young citizens concerning the ecological implications of their activities the best answer to the future of the Nation's resources?
2. How has man preserved his forest resources?
 - a. How has reforestation affected man's forest resources?
 - b. What other wise practices in lumbering have helped preserve our natural forests?
 - c. What unwise practices in lumbering have been destructive to our natural forests?
 - d. How has creative development of synthetic materials helped conserve and preserve our forest resources?
3. What legal provisions protect and preserve wildlife and forests?
 - a. What restrictions has man imposed on hunting?
 - b. What laws has man developed governing the use of streams for fishing?
 - c. What areas has man provided for the protection of wildlife?
 - d. What restrictions has man made on the use of forests which has curtailed his waste of them?
 - e. What departments and agencies (local, state, national) has man created to preserve and conserve his wildlife and forests?
4. How does the forest affect man's economics?
5. How had hunting practices in early America affect the westward migrations in this country?

ACTIVITIES

- 1a. Encourage students to dramatize in pictures, skits, and stories, what man can do to conserve wildlife. Suggested approaches include animating animals such as Smokey the bear, Terrence the tick, Franky the fish, David the deer, etc. Have the children create example situations in which man is helping and hindering these creatures.
- b. Develop picture or word stories in which students depict campers and other people who, because of ignorance or carelessness, have upset the balance of nature in the process of fulfilling their needs. The class can project what will happen if the destruction continues. A time line or panel pictures could show the progressive devastation that will occur if man continues to abuse his natural resources.
- 2a. A trip to a park or other wooded area with the purpose of highlighting the number and variety of trees there and the consideration given them, would demonstrate wise conservation measures. (Example: the Rhododendrons are saved to help avert soil erosion).
- b. Direct the children to do research in the classroom on the kinds of synthetic materials used in place of wood.
- c. If possible, invite a forest ranger or other conservationist to talk to the students about his work. The children may write to appropriate sources for information about their activities in regard to preservation and conservation of resources.
- 3a. Direct students to game magazines and pertinent materials on game laws. Some may write to authorities who may supply specific information. A calendar might be developed by the class on which they record the beginning of the deer season and the trout season, etc.
- *b. On a trip to a controlled natural area, such as the Arboretum, the students may note all the wildlife that is protected by this area.
- c. Students may write to various departments and agencies, or representatives from these agencies may visit the class as they become familiar with the work of departments and agencies which preserve wildlife and forests.

6. The following films support the concept developed here:

"Bounty of the Forests", S.S.A.V.L.
"Forest Conservation", D.C.R.I.M.C.

TERMS TO UNDERSTAND

conservation	creative
curtailed	destructive
imposed	prescribed
preserve	restrictions

B. Good farming practices improve man's food supply.

QUESTIONS

1. What are some methods man has developed to use land economically and fruitfully?
 - a. How have rotation, contour farming, terrace farming, strip farming, fertilization and irrigation, helped save the land?
 - b. In what ways has man's technical progress increased the value of land and its products?

ACTIVITIES

1. Visit a farm where the rotation, contour farming and other methods of conserving land are actively practiced.
2. The following audio visual materials may be used at strategic times throughout the unit study.

Films:

"Food or Famine", Shell Oil
"How Weather Helps Us", Cor., Syr.
"How Insects Help Us", D.C.R.I.M.C., Cor.,
Syr., Ind.
"How Plants Help Us", Cor., Syr., Ind.
"Conserving Our Soil Today", Cor., Syr.,
Ind.
"The Story of Soil", Cor., Ind.

Filmstrips:

"Soil and Water", Curriculum Filmstrips

Flannelboard Set:

"Animals in the Field", Instructo Corp.

TERMS TO UNDERSTAND

contour farming	rotation
economical	strip
fertilization	technical
irrigation	terrace
practices	agricultural technology

C. Man has harnessed water for power.

QUESTIONS

1. What early industries depended on water power?
2. What existing industries use hydro-electric power?
3. How does water relate to political topics. (i.e., Tennessee Valley Authority, Blue March Project, Construction of Hoover Dam, Erie Canal, Etc.)

ACTIVITIES

1. Trace the growth of a specific industry from the mills which originated near water power to the present factories. Students may make a diorama or roll movies in which they show successive stages of the process which makes the raw material a finished product.

The representations the students construct may depict early industries and their use of water power and modern industries which use hydro-electric power.

Filmstrips which might be used with this activity include: "The Story of West Coast Lumber", West Coast Lumberman's Association.
"Coal Mining", S.V.E.

TERMS TO UNDERSTAND

harnessed hydro-electric power

INSTRUCTIONAL MATERIALS

Films (16 mm)

"Bounty of the Forests", West Pine Assoc., S.S.A.V.A.

"Conserving Our Soil Today", Cor., Syr., Ind.
"Food or Famine", Shell Oil
"Forest Conservation", E.B.F. S.S.A.V.L.,
D.C.R.I.M.C.
"How Insects Help Us", Syr., Ind., D.C.R.I.M.C.
"How Plants Help Us", Cor., Syr., Ind.
"How Weather Helps Us", Cor., Syr.
"The Story of Soil", Ind.

Filmstrips:

"American Farmer and Our Food Supply", Eyegate #54
"Coal Mining", S.V.E.
"Soil and Water", Curriculum Filmstrips
"The Story of West Coast Lumber", West Coast
Lumberman's Association

Flannelboard Set:

"Animals in the Field", Instructo Corp.

- III. MAN, AS THE MOST INTELLIGENT ORGANISM, HAS AN OBLIGATION TO HIS SOCIETY TO FOSTER IN ITS CITIZENRY THE ATTITUDES, INTERESTS, AND APPRECIATION THAT WILL DEVELOP CIVIC AND MORAL RESPONSIBILITY FOR THEIR ENVIRONMENT.

A. An interest and appreciation of their natural environment should be reflected in favorable attitudes of American youth toward their country's beauty and bounty.

QUESTIONS

1. In what ways has man contributed to making "America the Beautiful" ?
2. How has man's environment supplied his physical needs?
 - a. What basic materials has the natural environment supplied for man's health and comfort?
 - b. In what ways have man's environs provided him with a natural playground?
3. In what ways have the characteristics of the United States' natural environment contributed to its power and wealth as a nation?
 - a. What are some minerals the U.S. provides for domestic and foreign markets?
 - b. What are some leading exports of the U.S. which are products of its natural environment?
 - c. How has the United States development of its natural resources been a contributing force in its high standard of living?
 - d. In what ways has industrialization emphasized the need for increasingly wise use of our natural resources?
 - e. For what natural resources are we dependent on other nations?

ACTIVITIES

1. Direct the children to collect as many pictures as possible depicting the natural beauty of their country. These might be mounted on a large scroll "movie". Another collection might show "America the Ugly" in which scenes of man's devastation are featured. Children may want to take or draw pictures of the natural environment for the scroll movie depicting "America the Beautiful".

2. Direct the students to make a list of all items in their surroundings that came from such basic resources as water, sun, soil, plants and animals. A chart with these headings would help them organize their findings. The comprehensiveness of their final charts should make them aware of how much their life is affected by their "natural environment". Children may develop a list of vocations which have come about as man has developed his environment. Maps might highlight lumberjacks in New England, miners in Pennsylvania, farmers in the West, Etc.
3. Construct a map of examples of America's natural wealth after studying several references. Find out where such materials are exported, and how they are used on the domestic market. This map may accompany a table display on which samples of natural resources are featured. This map would have implications for discussion and trips to the "field" to discover how man can help conserve his wealth in nature. By taking a common setting and having each of three committees develop a frieze depicting the use of natural resources at three different stages of our nation's growth, the children can learn how industrial development has changed man's way of life through three periods of our nation's growth. An example might be a scene in 1800, 1900, and 1972, at the same location. Take students to a local natural area. Point out to them that this forest is near its peak of growth. This might be an example of a natural scene where people lived in 1800. By using this as a beginning, children may fill in the changes that man wrought in 100 years. What has happened here today that has further changed it from the natural state?
4. The following films are related to activities 2 and 3:
 "Life in a Woodlot", McGraw-Hill, S.S.A.V.L.
 "Life in a Deciduous Forest", International Film Bureau, S.S.A.V.L.
5. Filmstrip: "Plants and Animals in Their Natural Environment", S.V.E.

TERMS TO UNDERSTAND

appreciations	domestic	interests
attitudes	environs	moral
citizenry	foster	obligations
civic	industrialization	responsibility

B. Good citizens must feel a personal respect for their environment.

QUESTIONS

1. What are ways in which young citizens can be helped to feel that nature belongs to them?
 - a. What direct experiences may one have in nature which foster a personal relationship with his natural surroundings?
 - b. What habits of thought and action will lead one to respect the dignity and value of his natural habitat?
2. What are some tangible evidences of nature's good will to man?
 - a. What foods come straight from nature without processing by man?
 - b. What direct values do the trees have for man?
 - c. How does wildlife contribute directly to health and happiness?

ACTIVITIES

- 1a. Children can be guided into experiences with nature that sharpen their awareness of it: they may plant seeds in individual containers or in large room gardens or at home in garden plots. Entrusted with the care of their own plants they will feel a more personal obligation for their proper care.
- b. Some of the plants they are nurturing can be subjected to less than optimum conditions. The students, in observing what neglect does to the plants they are nurturing, will take pride in the good care they are giving their other plants.
- c. A bird feeder, strategically located near the classroom, will provide motivation for bird study in the classroom. Children become more aware of birds, their care, and the contributions they make to their habitat.
2. Students can set a table in the classroom with many of the foods nature provides. Root and leafy vegetables, fruits and meats from wild and domesticated animals can be placed on display. If it is Thanksgiving time the students might

set two tables comparing the "straight from nature" array the Pilgrims had with the processed dinner they now get on Thanksgiving. Filmstrips which will enlarge on this activity" "American Farmer and Our Food Supply", set #54, Eyegate. Use the Teach-a-Chart set #101: "Farm Animals", Eyegate.

TERMS TO UNDERSTAND

dignity	need
habitat	respect
tangible	understanding

C. A responsible citizen must be kept enlightened in order to fulfill his obligations.

QUESTIONS

1. What personal habits and group measures should man develop to combat industrial practices that have been harmful to man and his natural environment?
 - a. What can individual citizens do to help guard against water and air pollution?
 - b. What measures should citizens encourage and support to guard against industrial pollution of water and air?
2. What can man do to guard against misuse and depletion of natural resources by industry?
 - a. What natural products are being used extensively and intensively by industries?
 - b. What national, state, and local agencies are helping put controls on industrial use of natural resources?

ACTIVITIES

- 1a. Select a nearby stream which local industry has polluted. Students may study the situation that caused the pollution and any other phases of industry's operation that would reveal its uses and abuses of natural materials.
- b. Students may be encouraged to propose ways in which industry might curb harmful practices. These suggestions might culminate in oral and written communication (letter, editorials, speeches, poetry and stories) to school, local and national authorities.

2. Show the following films and filmstrips to demonstrate pollution and other practices harmful to natural resources

Films: "Clean Waters", Ind., S.S.A.V.L.
"Conserving Our Water Resources Today",
Cor., Syr.

Filmstrips: "Conservation", Eyegate. M.E., 1404.
"Conservation for Today's America",
S.V.E., Set 433, S.R.

TERMS TO UNDERSTAND

depletion	pollution
extensively	discharge
intensively	abuse

INSTRUCTIONAL MATERIALS

Films (16 mm)

"Clean Waters", G. E., Syr., Ind., S.S.A.V.L.
"Conserving Our Water Resources Today", Cor., Syr.
"Life in a Deciduous Forest", International Film
Bureau, S.S.A.V.L.
"Life in a Woodlot", McGraw-Hill, S.S.A.V.L.

Filmstrips

"American Farmer and Our Food Supply", Set #54,
Eyegate
"Conservation", Eyegate, M.E. 1404
"Conservation for Today's America", S.V.E.,
Set #433, S.R.

IV. ADVANCES IN SCIENCE AND TECHNOLOGY HAVE HELPED RAISE MAN'S LIVING STANDARDS AND HAVE INCREASED HIS LEISURE TIME.

A. Man has consistently used his natural environment to meet his needs and demands.

Questions:

1. How has advanced technology changed man's way of life?
 - a. What effect is automation having on man's leisure time?
 - b. How has mass production affected people?
 - c. What effect does increased availability of the nation's wealth have on man's standard of living?
 - d. What relationship exists between man's increased leisure time and his demands on his natural environment?
 - e. How is man concerned with the diminishing ratio of space to population?
2. How will more leisure time affect man's use of his natural environment?
 - a. What sound conservation practices will man have to adopt and enforce?
 - b. What is the result of man's abuse and waste of his natural resources?
 - c. How can man enjoy outdoor sports, hobbies, and other interests, and, at the same time conserve his environment?
 - d. What are the ecological implications of increased leisure time in the great outdoors.

ACTIVITIES

1. Have the students trace the complete "Story" of some need of theirs, such as food, housing, furniture, TV, baseball bats, etc. They may divide strips of construction paper into a comic strip type framework with a frame for each step in the development of the product from its beginning to its finished state. Thus, a bat starts as an ash tree; it is cut and transported to a lumber mill; it goes next to a factory where it is fashioned into a bat. It is then marketed in a wholesale or retail store. A consumer buys it and finally a boy might be shown swinging it in a ballgame. Students and teachers may discuss the implications inherent in mass production, automation, a raised standard of living, and finally, the demands man is making on his natural environment.

2. Initiate plans for a conservation newspaper in which the students do background research and follow it up with news articles on measures which man is enforcing to encourage sound conservation. Cartoons might show man's abuse of natural resources; editorials might expound on what students can do to conserve, etc. There might be a regular column "From Arboretum". Animal characters might write to the paper telling of their plight as a result of man's abuse of their environment.
3. The following filmstrip illustrates what the government is doing in the area concerning conservation: "Our National Parks", Eyegate, Set #126, National Parks, Life.

TERMS TO UNDERSTAND

abuse	diminishing	standard of
automation	leisure time	living
availability	population	strategy
demands	technology	waste

- B. Machines have made man's life easier and the demands on his earth more intense.

Questions

1. How has the machine age affected man's way of life?
 - a. What machines have revolutionized man's economy?
 - b. How did some machines improve man's approach to his environment?
 - c. What machines replaced man, in part or entirely?
 - d. What affect have machines had on releasing man for other activities?
2. How have machines intensified man's use of his earth's resources?
 - a. What resources have been depleted by machines?
 - b. What are some constructive uses of machinery in developing man's resources?
 - c. What are some destructive uses of machinery in developing man's resources?

ACTIVITIES

1. After students have studied the principles of simple machines, they may be guided into considering the widespread effects machines have on man. Then have

students plan a Science Museum in which
machines and their effects on man are
featured.

TERMS TO UNDERSTAND

intensified
pursuits
economy

- C. With technological advancement and increased human demands, man is rapidly consuming his natural resources.

QUESTIONS

1. In what specific ways have man's rapid advances in technology resulted in an alarming consumption of natural resources?
 - a. What diversified uses has man found for lumber that caused him to cry, "Timber"! too often and too recklessly in his industrial development?
 - b. What resources, once plentiful, now must be imported to maintain industrial progress?
 - c. What effect does America's place in the industrial world market have on its success as a world power?
2. What forces on the American scene have brought about increased human demands on natural resources?
 - a. How has a rapidly expanding population affected the supply of natural resources?
 - b. How has a higher standard of living for an increasing number of Americans made demands on natural resources?
 - c. How has increased leisure time affected man's demands on his natural resources?
 - d. What commodities, once considered as luxuries, have become common in urban society?
 - e. How have highly developed communication and transportation media affected man's development of his natural wealth?

ACTIVITIES

1. Make four drawings of Uncle Sam showing him with a pocketful of natural resource wealth. Let these represent the years 1700, 1776, 1812, 1861, 1898, 1914, 1941, 1951, 1965, 1972. Have these show him getting progressively poorer in terms of natural wealth.
2. In a series of pictures of Uncle Sam depict him calling "Timber" at various times in our 300 year old history. Each picture might show the kinds of timber he was cutting and his uses of it. Show the transparency, "Tree Harvesting".
3. Use a socio drama to trace and identify the historical changes of emphasis from one period to another during which, what was once a luxury, has become a need in a highly industrial society.

4. Direct a playlet in three scenes showing a family in 1900, before man could fly, another scene with the same family in 1920, when flying was a relative luxury, and another scene three generations later when the airplane had become an integral part of man's life. The automobile, television, radio and other transportation and communication media may also be highlighted to develop the concept. As a further development, students can be guided to see that the change from luxury item to necessity has resulted in increased demands on the elements of nature.
5. Show the filmstrip: "Face of the Land", Life, to show man's changing progress.

TERMS TO UNDERSTAND

commodities	diversified
consumption	supply and demand

INSTRUCTIONAL MATERIALS

Filmstrips: "Face of the Land", Life.
"National Parks", Life.
"Our National Parks", Eyegate # 126

Transparencies:

"Tree Harvesting"

- V. POPULATION EXPLOSION HAS MADE IT IMPERATIVE FOR MAN TO RECONSIDER HIS USE OF NATURAL RESOURCES IN A CONSTRUCTIVE AND CONSERVATIVE MANNER.

A. Population explosion sets off an economic chain reaction which, in turn, emphasizes the need for sound ecological practices.

QUESTIONS

1. What are some of the problems which population explosion is creating?
 - a. What are some specific examples of demands that increasing population is making on the earth's natural resources?
 - b. What is the relationship between population explosion and the need for more areas of recreation?
 - c. How has population explosion emphasized the need for conservation education?
 - d. How has population explosion inspired and required man to be more creative in his development of his natural resources?
2. What relationship does today's economic situation have with man's ecological practices?
 - a. How has population affected the amount of natural resources in an area?
 - b. How has population of one area affected the amount of natural resources in other areas?

ACTIVITIES

1. On a trip to the arboretum or state park develop the idea that man not only is depleting his natural resources but is upsetting the balance of nature. Compare heavily wooded areas with open fields. In removing the timber how has man affected the populations of insects, mice, birds, squirrels, and rabbits in this area? What effect have these changes had on the balance of nature?
2. Set up a series of "mock trails" in which those who practice unsound ecology may be tried: farmer, lumberman, housing development builder, industrialist, "sportsman". Those who are convicted must swear to uphold the Conservation Pledge:
"I give my pledge as an American to save and faithfully defend from waste the natural resources of my country - its soil and minerals; its forest, water and wildlife".

3. Project and discuss at an expedient time during these activities the film, "Forests and Conservation", Cor.
4. Project and discuss the following filmstrip set, "Conservation for Today's America", S.V.E. 433, which shows how man is constantly striving to conserve his resources?

TERMS TO UNDERSTAND

"earth's natural supply"
"ecological practices"

chain reaction
locality

B. Man may upset nature's balance by unwise and careless practices.

QUESTIONS

1. What are some of man's practices which have upset the balance of nature?
 - a. How has man's wholesale spraying of mosquitos contributed to the gradual extinction of the bald eagle?
 - b. How are food chains seriously disturbed if predators, such as hawks, are killed in great numbers?
 - c. What affect have poor farming practices had on the balance of nature?
 - d. How does lack of planning in housing development result in imbalance in nature?
 - e. What are some disadvantages of the bounty system.
2. What is man's role in the balance of nature?
 - a. What is man's role in his environmental niche?
 - b. What other organisms share man's habitat?
 - c. What is man's role in his ecosystem? In his biome? In his biosphere?

ACTIVITIES

1. Using flannel board, chalkboard or paper food chains, have students show how man upsets the balance of nature.
Show the transparency "Energy Pyramid". One example might show the change of events from the spraying of the mosquitos to the poisoning of bald eagles.
2. Children may be made aware of their role by discussing

their 'biological addresses' such as:

niche address

habitat address

ecosystem

biome

biosphere

These may be featured on letter heads and may be compared to their addresses in the physical universe.

home

town

state

country

planet

TERMS TO UNDERSTAND

balance of nature

food chain

predators

"wholesale spraying"

C. Recent population trends make it imperative for us to reconsider the use of our resources.

QUESTIONS

1. How much has the population of America increased since 1790?
 - a. What was the population of colonial America?
 - b. Where was the population concentrated in 1790?
 - c. What was the size of America's population in 1800? 1360? 1900? 1930? 1945? 1960? 1970?
 - d. At the present rate of growth what will the population be in 2000?
 - e. Where are the population centers in today's culture?
2. What must man consider in order to insure his survival?
 - a. What natural areas remain for recreation of a huge populace?
 - b. What esthetic and civic values must be developed if a large populace is to save its natural setting?
 - c. What are some of the conservative and preservative practices employed in using natural resources in a highly industrialized and growing society?
 - d. What is some of the local legislation in your area enforced for the preservation of natural areas?

ACTIVITIES

1. Have students make graphs and maps depicting the

changing growth trends of population in America.

Some maps may show the megalopolis of which local students are a part (strip of land from Boston to Washington).

2. Have students construct a model city of the future. Consideration should be given to recreation areas, size of the population and esthetic and civic values.
3. Utilize the following audio visual aid as an introductory or concluding activity in the development of this concept. Sound filmstrip: "The Revolution of Expectations", Life.

TERMS TO UNDERSTAND

esthetic	survival	rural
populace	urban	legislation
population density	suburban	civic responsibility

INSTRUCTIONAL MATERIALS

Films (16mm) "Forests and Conservation", Cor.

Filmstrips: "Conservation for Today's America", S.V.E.
433.
"Revolution of Expectation", Life.

KEY TO INSTRUCTIONAL MATERIAL

All films listed may be ordered from any film source available to the school.

The filmstrips listed are available from commercial sources.

KEY

C.M.	Curriculum Materials Inc. 1319 Vine Street Philadelphia, Pennsylvania
D.C.R.I.M.C.	Delaware-Chester County Regional Instructional Materials Center 14 Anderson Hall State College West Chester, Pennsylvania (Formerly, Del-Ches Film Library)
D.P.I.	Department of Public Instruction Harrisburg, Pennsylvania
E.	Eyegate
E.B.F.	Encyclopedia Britannica Films 1150 Wilmette Avenue Wilmette, Illinois 60091
Ind.	Indiana University Film library Bloomington, Indiana
N.F.B.C.	National Film Board of Canada 1270 Avenue of Americas New York, New York
Penn S.	Pennsylvania State University Film Library University Park, Pennsylvania
S.P.	Stanbow Productions 12 Cleveland Street Valhalla, New York
S.S.A.V.L.	Southeast Suburban Audio-Visual Library South Wayne Avenue Wayne, Pennsylvania
S.V.E.	Society of Visual Education 1345 Diversey Parkway Chicago, Illinois 60614
Syr.	Syracuse University Film Library Syracuse, New York 13219

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EVALUATION

Evaluation should consist of the use of many techniques and should always measure in terms of the performance objectives.

1. Teacher-made test
2. Standardized test
3. Evaluation by discussion, demonstration, experimentation, and observation.
4. Pre-test
5. Experiences
6. Post-test

Materials

1. Materials for the classroom
 - a. Films (see list in Curriculum Guide)
 - b. Pictures
 - c. Magazines, newspapers
 - d. Reference books
 - e. Exhibits, objects, specimens, models, mountings, dioramas.
 - f. School room plants, animals
 - g. Maps, globes
 - h. Charts, posters, graphs
2. Materials from the Community
 - a. Homes
 - b. Public museum
 - c. Local stores and industries
 - d. Chamber of Commerce
 - e. Corporations
 - f. Local Environment Agencies (see other list in Curriculum package)
 - g. Ponds, streams, other resource areas in the community.